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Thomas C. Jednacz

August 18, 2003

By Federal Express

Marlene H. Dortch, Secretary
Federal Communications Commission
Office of the Secretary
9300 East Hampton Drive
Capitol Heights, MD 20743

Re: In the Matter of Inquiry Regarding Carrier Current Systems Including Broadband over Power Line Systems ET Docket No. 03-104

Dear Ms Dortch::

Enclosed herein please find an original and four copies of the Reply Comments of Thomas C. Jednacz, P.E. in ET Docket No. 03-104. Also, enclosed is an additional copy of the first page of said document. Please have your staff date stamp the copy of the first page and return it in the self-addressed stamped envelope which has been provided for your convenience.

Thank you.

Sincerely,

TCJ

Thomas C. Jednacz

Enc.

Before the
FEDERAL COMMUNICATIONS COMMISSION
WASHINGTON, D.C. 20554

In the Matter of	)	
	)	
Inquiry Regarding Carrier Current Systems Including *Broadband over Power* Line Systems	)	ET Docket No. 03-104
	)	
	)	
To The Commission	)	

REPLY COMMENTS OF THOMAS C. JEDNACZ, P.E.

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P.O. BOX 2066
DUNNELLON, FL 34430-2066

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REPLY COMMENTS OF THOMAS C. JEDNACZ, P.E.

INTRODUCTION

I have over 30 years engineering and management experience in Power Electronics and RF Lighting. The EPA gave an award to our company for developing energy saving, cost reducing, reliable RF lighting products that reduce pollution. I have experience with Harmonic Power Factor, Conducted and Radiated RF energy in actual field use of RF Lighting and Power Electronic products. We found many of the problems associated with PF, Conducted and Radiated RF as a result of pioneering the industries. We had to solve the problems ourselves because we were the first in the industry and the FCC rules were not adequate for the new technology. My personal experience is that even small amounts of conducted or radiated RF that meet FCC Part 15 requirements is enough to disturb sensitive equipment and control systems. I recommend that BPL NOT be approved until every potential interfering situation has been TESTED IN ACTUAL FIELD USE CONDITIONS and the FCC has developed rules and regulations adequate to protect people and equipment.

It is imperative that all medical equipment be tested for susceptibility to BPL since it comes into every electrical socket in every hospital, doctor's office and medical facility. BPL interference to medical equipment is a life and death situation. A Medical Doctor friend told me that Cell Phones are not allowed in hospitals because they have been shown to deactivate life saving/maintaining equipment and disturb test apparatus such as EKG machines. The FCC needs to

be absolutely sure that there will be NO interference to medical equipment – SOMEONE COULD BE KILLED if there is an unknown interference problem!

Chairman Powell of the FCC stated in the Washington Post that Cell phone systems have blocked Police, Fire and Ambulance radio calls. Neither the FCC nor the Cell Phone industry anticipated this so lets not do that again by introducing BPL without sufficient testing of every service in the HF and low VHF bands.

The latest power outage has shown that the Power Companies are having great difficulty using their existing technology. They should NOT be allowed to move to new technology until they can produce reliable, controlled power in their existing systems.

BPL has been rejected in Japan. A study needs to be done to determine why Japan rejected BPL and if those reasons apply to the United States power system. The study should also include European reported interference from BPL systems. Please learn from history. BPL produces interference in other parts of the world. Do not allow it to produce interference in the United States.

POTENTIAL LIFE THREATENING SITUATION

A medical doctor friend told me that hospitals do not permit Cell Phones to be used inside their facilities. There are proven cases where Cell Phones have shut down respirators. The patient did not die because a nurse turned the machine back on in time. FPL states, "Every electrical outlet could become part of a home-based symmetrical internet network, with no new wiring or re-wiring." This means that RF conducted and radiated energy will be omnipresent. Many new technology medical devices are very sensitive instruments. Life sustaining and testing equipment must never suffer interference. All medical equipment must be tested before BPL can be introduced. I can see the headlines now – "FCC approved system kills patient". Do not allow that to happen. The Washington Post (Monday, August 18, 2003, page A01) reports that Chairman Powell of the FCC acknowledges that Cell Phones have blocked the receivers in Police, Fire and Ambulance radios. Police in emergency situations have not been able to communicate. They had to use phones in nearby residences to talk to the dispatcher. There is a real possibility that BPL, with the power lines acting like high gain antennas, may create the same type of problem. BPL may also with its high gain antennas, cause interference to health, welfare, and safety radio systems in other countries by ionospheric propagation. Amateur radio has demonstrated that RF levels of 100 milliwatts are capable of communicating with Europe from the United States.

BPL HAS NOT BEEN PROVEN TO BE A VIABLE TECHNOLOGY IN ALL CERCUMSTANCES

Laboratory tests and field tests on good clean lines has shown that the system will work. Have the power companies tested the system with grossly leaky insulators, dirty insulators, and leaky lightning arrestors or corroded switches? My experience with Power Line Carrier and Carrier Current Systems says that it will not be reliable. Power line maintenance has not been a high priority with power companies. Mr. Riley Hollingsworth of the FCC enforcement bureau has sent multiple letters to several power companies stating they are violating radiated interference levels. The power companies have ignored these violations even though they are subject to fines. If the power companies fail to maintain their lines in the face of fines, will they properly maintain the lines used by BPL? I think not. Power companies need to conduct tests on their generators and motors. It has been shown in the power electronics industry (references will be supplied if requested) that low and high frequency energy circulating in the system will deteriorate bearings in motors. Will applying RF to the power line damage all the motors in a home or office building? Thousands of hours of testing will be needed to prove that BPL is safe. This was a very costly item for the motor speed control industry. Test before install. Prevent repeating problems. The damage and cost could be massive. We must determine that BPL is safe for motor and generator bearings before this is inflicted on the customers. Will low pass filters be required on all motors, clocks, appliances, telephone apparatus, etc. in order to install BPL? This is not a viable application.

BPL FACILITIES BASED COMPETITION

The competition BPL faces is Satellite, Cable and DSL all of which provide equal or greater bandwidth for a similar cost. It is my opinion that we do not need a new competitive entry. All that will happen is that the profits of the existing companies regulated by the FCC will drop. The bandwidth of BPL is proposed to be 78 Mhz, which is much to small to be of value except for telephone or limited Internet connections. FPL says in their comments "Every electrical outlet could become part of a home-based symmetrical internet network, with no new wiring or re-wiring." The concept sounds appealing but buy connecting to every outlet they create a ubiquitous situation where every appliance, security system, clock, TV, radio, short wave radio, and medical device they have in the home MUST be tested to be interference free before BPL is installed or put in service. The power industry has not shown any data to prove that there is no interference to other service providers who share the same power poles.

BPL ENHANCED UTILITY SERVICES AND OPERATION

FPL states "FPL has a great interest in the potential of BPL to enhance utility operations and to reduce costs of utility operations benefiting FPL customers." The recent power black out demonstrates that the power companies need to desperately enhance their operations. BPL, with all the problems mentioned above, will not be reliable enough to enhance operations. The proper solution is to install fiber optic lines on the existing power poles. This solution would provide reliable utility communications plus enough bandwidth to be real competition to other communication services. A life cycle income versus reliability and cost study needs to be completed before BPL is approved.

BPL INTERFERENCE IS NOT A LOW RISK

FPL, Intellon, and others state that there will be no interference because the components meet FCC Part 15 regulations. The FCC in NOI 03-104 states that BPL was not considered in developing Part 15 regulations. FPL states in their comments "FPL believes that existing FCC Part 15 radiated compliance rules sufficiently govern both access and in-home BPL technologies. FPL also supports elimination of conducted limits, as radiated emissions are the true indications of interference potential." This statement is in direct contradiction to the NOI. My position is that Part 15 rules and regulations are NOT sufficient to determine if interference will occur. My RF Lighting experience proves that Part 15 will not protect customers in all circumstances. Security systems, remote control systems, etc. did suffer interference even though the product met FCC Part 15 limits. Hospitals would not allow the product in sensitive areas even though it met FCC limits. Conducted limits must be a part of the new regulations. Antenna theory says that an RF current conducted down a wire will radiate if the physical length of the wire is a significant portion of a wavelength (Electronic and Radio Engineering – Fourth Edition – Frederick E. Terman, Chapter 23). Antennas can have significant gain and directivity. Complex electrical grids are very difficult to model. They must be tested "in situ" and if found to cause interference must be permanently removed. FPL states that BPL components are FCC certified to Part 15 limits. This is impossible since NOI 03-104 states that the FCC has not established testing procedures or limits for BPL. Approval to current FCC Part 15 limits is insufficient to prove safety. FCC part 15 approval is no guarantee that the amount of radiated energy on high gain antennas (FPL has 69,000 miles of high gain antenna in service) will be at interference free levels. FPL in foot note 5 states: "FCC Order 97-Section 157 essentially places the burden on BPL opponents to justify why a new entrant or technology that may provide more affordable telecommunications to a broader base of customers, should not be approved. FPL believes that arguments voiced by amateur radio forums do not meet this burden, and remain unsubstantiated and speculative without direct evidence that BPL vendors' technologies cause interference in excess of approved limitations established by FCC guidelines." This statement is

worse than just nonsense. It could result in life threatening situations. FPL and the others, to my knowledge, have not provided any "in situ" measurements to prove that BPL does not create interference. ARRL has delivered a 120 page comment to the FCC with data recorded "in situ" plus computer simulations performed with Government approved programs (NEC-3) that prove BPL interference could be as much as 25 to 40 dB over Part 15 limits (ARRL computer simulations). The comments by FPL appear to be of self-serving non-technical nature. The FCC must protect the public by introducing a new set of rules and regulations for the BPL service. Lives may be at risk.

SUSCEPTIBILITY OF BPL EQUIPMENT

Radio frequency interference goes both ways. What susceptibility standards are used to design BPL equipment? Broadband repeaters have front ends susceptible to overload and distortion in the presence of strong RF signals. Broadcast, government and military transmitters have outputs over 50,000 watts in the MF, HF and low VHF bands. Even Amateur Radio transmitters with modest 5dB gain antennas will impact power lines with over 4,700 watts of RF power. A 10 dB gain antenna will impact the power line with 15,000 watts of RF power. Power lines are also gain antennas. The RF power above will be increased by the gain of the power line antenna. All BPL equipment, receivers, transmitters, repeaters, bridges, etc. must be built to withstand this RF environment without distortion or reduction in performance. The presence of high power RF on BPL equipment may cause it to transmit harmonics. Harmonics could interfere with aircraft communications and ILS which could cause yet another life and death situation. BPL is just too dangerous to be introduced.

POWER COMPANY TECHNICAL CAPABILITY

I have met with electric power company engineers (up to 1996) around the U.S. in regard to our power electronic and RF lighting products. We were concerned with conducted interference, radiated interference and harmonic power factor. Most of the power companies with whom I met did not have an engineer on staff qualified to discuss these items. The power companies that did have qualified engineering on staff had only one qualified engineer for their entire company. Unless they have greatly enhanced their RF and electronic engineering capability, the power companies cannot properly install and maintain a BPL system.

CONCLUSION

Broadband over Power Lines must not be adopted. Interference in Europe and Japanese rejection of BPL is sufficient proof that it should not be tried here. Life threatening situations are possible in hospitals, doctor's offices, medical facilities, military, commercial aircraft and homeland defense communications. There is too much uncertainty at this point to allow BPL to be installed. Foreign broadcast stations may consider radiated BPL RF to be "jamming". Power company business plans built around BPL are flawed. They failed to consider the difficulty of installing and maintaining the system for interference free operation. Installing fiber optic lines on their poles is a much better long range plan for all the items they sited in their business plans.

The arrogance of the American Public Power Association in stating that all current HF and low VHF licensed services must accept the possible interference levels or move to other frequency assignments is sufficient proof that the Electric Power Industry cannot be trusted with BPL technology.

The latest major power black out is strong evidence that the power companies are not currently able to introduce new technology. I strongly urge the FCC to reject BPL.

Respectfully submitted,

Thomas C. Jednacz, P.E.

August 18, 2003